

simpler woods growth rings do not become a fixed or structural feature. The simpler type of growth ring occurs in both the Mesozoic and recent cycads, and Chamberlain finds rings in a monocotyl. Accentuation of growth ring must at first have gone on very slowly as measured by geologic periods, and is mainly correlated with the more marked tracheid and wood ray differentiation of mid to later Mesozoic time.—G. R. WIELAND.

BOOK REVIEWS

CHASE'S FIRST BOOK OF GRASSES*

The increasing disposition among beginning students in botany to select the grasses as a special field of study will no longer be hampered by the lack of an adequate hand-book. Mrs. Chase has demonstrated, contrary to the practice of the ordinary "How To Know" botanical literature, that scientific method need not be sacrificed in order to make the subject attractive to the beginner. From the beginning she urges the student to study the grasses themselves; but as these cannot be provided in a book, a series of careful drawings, purportedly somewhat diagrammatic, is furnished. The student is made clearly to understand that the classification of grasses is based on the *spikelet*, and the first lessons are therefore devoted to a careful study of the general structure of the theoretical spikelet. From this *generalized* spikelet the author passes to a study of its actual modifications in the order of increasing complexity. Beginning with the *pedicelled* spikelet having more than one floret as approximating most closely to the ideal diagrammatic form, we pass from the simplest type as shown in *Bromus* through the best-known typical genera of the tribe Festuceae to the most complex modification of the type in *Scleropogon*. The returning to the simple spikelet illustrated in *Bromus*, a fresh start is made along another line of differentiation, which leads us from the simplest type of *sessile* spikelet in a two-sided spike as shown in *Agropyron* through the various modifications of spicate inflorescence to its greatest complexity in *Hordeum*. The progressive development of the spikelet with more than

* Chase, Agnes. A First Book of Grasses. Pp. 121, 94 figs. New York, The Macmillan Co. 1922. \$1.00.

one floret is then followed through the Aveneae, after which we pass to the pedicelled *one*-flowered spikelet as illustrated in the Agrostideae; thence to the sessile spikelet in the one-flowered spike of the Chlorideae, and finally to the highly specialized structures of Mazieae, Phalarideae, Oryzeae and Zizanieae. After thus completing the series Poateae, the more complex Panicatae are taken up in the same order, beginning with the single fertile floret of the Paniceae, and passing through the paired spikelets of Andropogoneae to the highly complicated inflorescence of Tripsaceae. The primary characters of the tribes are then summed up in a key, in which the spikelet and inflorescence of each tribe are illustrated by a careful diagrammatic drawing.

The order and relation of the tribes is that followed by Hitchcock in his recent *Genera of Grasses of the United States*,* but no attempt is made to invade the debatable ground of tribal phylogeny. A selected bibliography, together with some observations on botanical nomenclature and the general principles of taxonomy, closes the book.

The volume forms one of the Rural Text-Book Series under the general editorship of Dr. L. H. Bailey—a series in which the grasses have already been treated in Hitchcock's *Text-Book of Grasses* (1914), to which the present work will form an excellent introduction.

The drawings have been clearly and accurately made, and have been carefully reproduced. The typography is clear and attractive, and the proof-reading has been done with the most scrupulous care. In fig. 50 on p. 57 the letters A. and B in the legend have been inadvertently transposed. The book as a whole is thoroughly sound in its pedagogy, and will start the beginner on a road from which it will never be necessary for him to deviate, however far he may advance in his study of agrostology.—JAMES C. NELSON.

* U. S. Dept. Agric. Bull. 772. 1920.